



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/689,198

10/20/2003

Joseph D. Rainville

8540G-000213

4431

27572

7590

10/09/2007

HARNESS, DICKEY & PIERCE, P.L.C.

P.O. BOX 828

BLOOMFIELD HILLS, MI 48303

EXAMINER

ECHELMEYER, ALIX ELIZABETH

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

10/09/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/689,198	Applicant(s) RAINVILLE ET AL.	
	Examiner Alix Elizabeth Echelmeyer	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 8-15 and 17-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-15 and 17-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to the amendment filed July 19, 2007. Claims 1, 10 and 17 have been amended. Claims 7 and 16 are cancelled. Claims 1-6, 8-15 and 17-26 are pending and are rejected for the reasons given below.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The limitation "rapid discharge and charging characteristics" is indefinite because it is unclear what is meant by the term "rapid".

4. Claims 1, 3-5, 8-10, 12-14 and 18-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what the term "rapid transient mode" means. For the purposes of examination, "rapid transient mode upward" will be interpreted to mean start-up, and "rapid transient mode downward" will be interpreted to mean cool-down or shut-off.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-5, 8, 10-14, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (US 5,501,083) in view of Naito (US 5,780,980).

Kim discloses a system comprising a compressor (21) with a motor (20) and a controller (50). The controller (50) can select a power source from either a main power source (10) or a supplemental power source (62 and 63). The supplemental power source (62 and 62 in Figure 1) is capable of operating either at a minimum frequency or a higher frequency (abstract). The supplemental power source (62 and 63) operates at a voltage that is higher than a reference voltage; the main power source (10) operates at the reference frequency or below (claim 4 of the prior art, as applied to claim 1 of the instant application).

As for claims 2-5, 8, 11-14 and 17, Kim teaches that the controller is used to determine which power-supplying device to use to power the compressor (column 3 lines 34-59). Also, Kim teaches that the compressor is operable at variable frequencies (column 1 lines 57-61). It would have been obvious to one having ordinary skill in the art at the time the invention was made to apply different amounts of power to, therefore changing the capacity of, the motor to provide the speed required by the compressor.

Kim fails to teach that the system is capable of using charging the supplemental power source during normal mode.

Naito teaches a power generation system comprising an auxiliary, or supplementary, power source, specifically a battery. The controller of the system uses the energy produced during normal operation to charge the supplementary power source (column 8 line 59 – column 9 lines 6). Additionally, Naito teaches the use of the supplemental power source during start-up of the motor.

It would be advantageous to charge the supplemental power source during normal operation such as taught by Naito, since charging the power source would ensure that needed power would be available, for example during start-up.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to charge the supplemental power source during normal operation such as taught by Naito, since charging the power source would ensure that needed power would be available, for example during start-up.

With further regard to claims 10-14, 17 and 18, Kim fails to disclose a fuel cell to produce electrical energy.

Naito teaches that the motor is powered by a fuel cell (abstract).

Naito further teaches that the fuel cell ensures long term operation while fuel is supplied and produces clean exhaust (column 1 lines 45-46).

It would be advantageous to use a fuel such as taught by Naito in the system of Kim since it ensures long term operation and produces clean exhaust.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a fuel such as taught by Naito in the system of Kim since it ensures long term operation and produces clean exhaust.

The limitations of claims 11-14 and 17 have been addressed above, namely that the apparatus of Kim is capable of performing the operations.

As for claims 18 and 20, the controller uses the battery of Naito to provide power to the motor during startup (column 9 lines 3-6).

7. Claims 1, 8, 10, 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hewitt (U.S. Patent Number 6,034,445) in view of Naito.

The teachings of Naito as discussed above are incorporated herein.

Hewitt discloses a system comprising a compressor and a motor (20) with a controller (22). The controller (22) can select a power source from either a main power source (32 or 38 or 40) or a supplemental power source (30). The supplemental power source is a battery. The system controls which power sources are used by opening and closing two switches (36 and 46 in Figure 1). Therefore, the controller can close both switches, allowing both the main and supplementary power sources to be used together, varying the speed of the compressor (as applied to claim 1).

Hewitt fails to teach that the system is capable of using charging the supplemental power source during normal mode.

Naito teaches a power generation system comprising an auxiliary, or supplementary, power source, specifically a battery. The controller of the system uses the energy produced during normal operation to charge the supplementary power source (column 8 line 59 – column 9 lines 6). Additionally, Naito teaches the use of the supplemental power source during start-up of the motor.

It would be advantageous to charge the supplemental power source during normal operation such as taught by Naito, since charging the power source would ensure that needed power would be available, for example during start-up.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to charge the supplemental power source during normal operation such as taught by Naito, since charging the power source would ensure that needed power would be available, for example during start-up.

With further regard to claims 10, 18 and 20, Hewitt fails to disclose a fuel cell to produce electrical energy.

Naito teaches that the motor is powered by a fuel cell (abstract).

Naito further teaches that the fuel cell ensures long term operation while fuel is supplied and produces clean exhaust (column 1 lines 45-46).

It would be advantageous to use a fuel such as taught by Naito in the system of Hewitt since it ensures long term operation and produces clean exhaust.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a fuel such as taught by Naito in the system of Hewitt since it ensures long term operation and produces clean exhaust.

As for claims 18 and 20, the controller uses the battery of Naito to provide power to the motor during startup (column 9 lines 3-6).

8. Claims 6 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hewitt in view of Naito as applied to claims 1 and 10 above, and in further view of Aoyagi et al. (U.S. Publication Number 2001/0051291 A1)

The teachings of Hewitt and Naito as discussed above are incorporated herein.

Hewitt in view of Naito does not teach that the supplemental power source is a capacitor.

Aoyagi et al. teach a power generation system that has a power unit such as a battery or a capacitor (paragraph 4, as applied to claim 6).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use a capacitor instead of a solar power source as the supplemental power in the system of Hewitt in view of Naito. The use of a capacitor as a power source is well known in the art and it is also well known to use a capacitor as a substitute for a solar source.

9. Claims 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hewitt in view Naito as applied to claims 1 and 10 above, and in further view of Raiser (U.S. Patent Number 6,616,424 B2).

The teachings of Hewitt and Naito as discussed above are incorporated herein.

Hewitt in view of Naito does not teach that the controller regeneratively brakes.

Raiser teaches that the power source can be used to realize regenerative braking (column 1, lines 39-40, as applied to claim 9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include the regenerative braking of Raiser in the compressor system of Hewitt in view of Naito so that the kinetic energy can be partly converted into electrical energy and then stored (column 1, lines 41-43).

10. Claims 1-5, 8, 10-14, 17, 21-23 and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raiser in view of Kim and Naito.

The teachings of Raiser, Kim and Naito as discussed above are incorporated herein.

Raiser teaches a method of operating a variable speed compressor (10) with a motor (12) and a controller (46) with a fuel cell (22) in a fuel cell system in Figure 1. The compressor is powered by a main power source during a normal mode (50 in Figure 1). Raiser teaches that through higher output the power of the motor (12) increases and thus the speed of the compressor (10 in Figure 1). The motor can be used for regenerative braking, taking kinetic energy and partly converting into electrical

energy, which can be stored in the battery (column 1, lines 39-40, as applied to claim 21).

Raiser teaches that a higher output increases the power of the motor, increasing the speed of the compressor (column 6, lines 25-30). Therefore, a second capacity of the motor is greater than a first capacity (as applied to claim 22).

Raiser does not teach powering a variable capacity compressor from a supplemental power source (21-26). Raiser does not teach that the second capacity is less than the first capacity when operating in a cool-down o (23). Raiser does not teach charging a supplemental power source during a normal mode (25). Raiser does not teach using power from a supplemental power source to increase the speed of the motor during start-up.

Kim teaches a system comprising a compressor (21) with a motor (20) and a controller (50). The controller (50) can select a power source from either a main power source (10) or a supplemental power source (62 and 63), or a solar panel. The supplemental power source (62 and 62 in Figure 1) is capable of operating either at a minimum frequency or a higher frequency (abstract). The supplemental power source (62 and 63) operates at a second capacity that is higher than a reference voltage; the main power source (10) operates at a first capacity that is either the reference frequency or below (claim 4 of the prior art, as applied to claim 21 of the instant application).

Kim teaches that the solar panel has a frequency greater than that of the main power source (claim 4 of the prior art, as applied to claim 22 of the instant application).

Kim teaches that the solar panel has a frequency that is less than that of the main power source when operating at a minimum (abstract, as applied to claim 23).

Kim teaches a solar panel as the supplemental power source and when not in use, the solar panel would charge while the main power source was being used (as applied to claim 25).

Kim teaches that the supplemental power source is used to increase the speed of a motor by operating at a second capacity, which is higher than a first capacity (claim 4 of the prior art, as applied to claim 26 of the instant application).

Kim in view of Raiser fails to teach that the system is capable of using charging the supplemental power source during normal mode.

Naito teaches a power generation system comprising an auxiliary, or supplementary, power source, specifically a battery. The controller of the system uses the energy produced during normal operation to charge the supplementary power source (column 8 line 59 – column 9 lines 6). Additionally, Naito teaches the use of the supplemental power source during start-up of the motor.

It would be advantageous to charge the supplemental power source during normal operation such as taught by Naito, since charging the power source would ensure that needed power would be available, for example during start-up.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to charge the supplemental power source during normal operation such as taught by Naito, since charging the power source would ensure that needed power would be available, for example during start-up.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the variable capacity compressor with a supplemental power source of Kim in the operating method of Raiser. The difference between the compressors system is the addition of a power source that is a matter of design choice. By having an added power source to increase the speed of the motor, the strain on the motor of the compressor system would be less, causing the motor to last longer. Therefore, it would have been obvious to use an additional power source in the compressor system.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the supplemental power source of Kim that operates at a downward transient mode where the second capacity is less than the first capacity, in the operating method of Raiser. The supplemental power source must eventually ramp down when it is done being used and as it ramps down there is a point where the second capacity is less than the first capacity. By having a supplemental power source that is used to ramp up the motor of the compressor, it must include the feature of ramping down and reaching a capacity that is lower than the first causing the system to return to normal mode and a main power source.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the supplemental power source that charges during normal mode of Kim in the operating method of Raiser. By using a supplemental power source that charges when not in use would be obvious for operational purposes. In order to use the supplemental power source when the time is needed to ramp up the compressor, it must be able to charge up at some point. The obvious time to charge the supplemental power source would be when it is not in use, which is what the supplemental power source of Kim does.

11. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Raiser in view of Kim and Naito as applied to claim 21 above, and further in view of Aoyagi et al.

The teachings of Raiser, Kim, Naito and Aoyagi et al. as discussed above are incorporated herein.

Raiser in view of Kim and Naito fails to teach that the supplemental power source is a capacitor.

Aoyagi et al. teach a power generation system that has a power unit such as a battery or a capacitor (paragraph 4, as applied to claim 24).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use a capacitor instead of a solar power source as the supplemental power in the system of Raiser in view of Kim and Naito. The use of a capacitor as a power

source is well known in the art and it is also well known to use a capacitor as a substitute for a solar source.

Response to Arguments

12. Applicant's arguments with respect to the limitations concerning selection of a supplemental power source and charging of that source have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground of rejection is made, see above.

The arguments concerning the battery of Raiser found on page 11 are not persuasive. It does not matter in what function the battery is being used; Raiser teaches recharging a battery, the teaching of using a battery as a supplemental power source is already found in Hewitt or Kim in view of Naito.

Applicant's arguments with respect to claims 10-20 have been considered but are moot in view of the new grounds of rejection, see above.

Applicant's arguments with respect to claims 21-23, 25 and 26 have been considered but are not found to be persuasive. The teaching of Raiser that converting kinetic energy to charging energy is the teaching that is of importance in the rejection. Since Kim in view of Naito teach a motor, and that motor may be braked to provide kinetic energy such as taught by Raiser, the limitations are met by the rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is 571-272-1101. The examiner can normally be reached on Mon-Fri 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy N. Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Alix Elizabeth Echelmeyer
Examiner
Art Unit 1745

aee



SUSY TSANG-FOSTER
PRIMARY EXAMINER